



# ***Military Sealift Command Energy Conservation***

## ***Operational Energy and Behavior Change***

### ***SECNAV Fleet Energy Training Forum***

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*Naval Air Station Jacksonville  
6 November 2014*

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driven*



# ***Agenda***



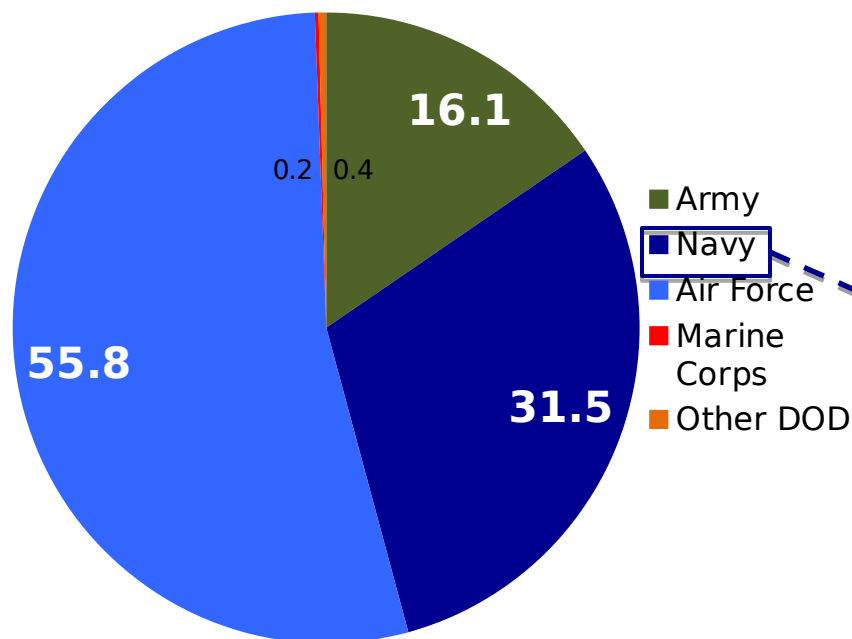
- ***Quantifying MSC's Fuel Usage***
- ***US Navy Energy Goals & MSC ENCON Program Alignment***
- ***MSC Energy Conservation and Culture Change***
- ***MSC ENCON Training***
- ***Summary***



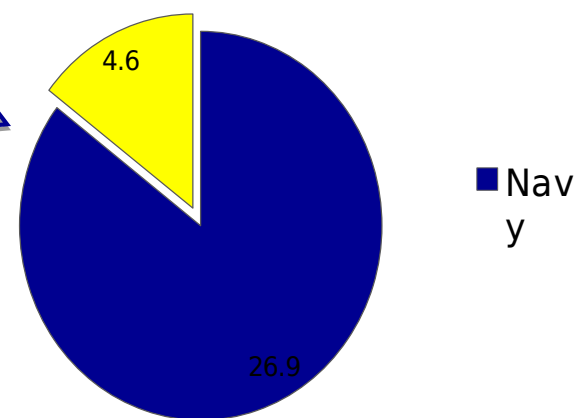
# DOD Fuel Usage



## DOD Operational Energy FY12 Total 104 Million Barrels



## Navy Operational Energy FY12 Total 31.5 Million Barrels (\$4.97B)



**MSC Represents 15% of the Navy's Operational Energy Usage**

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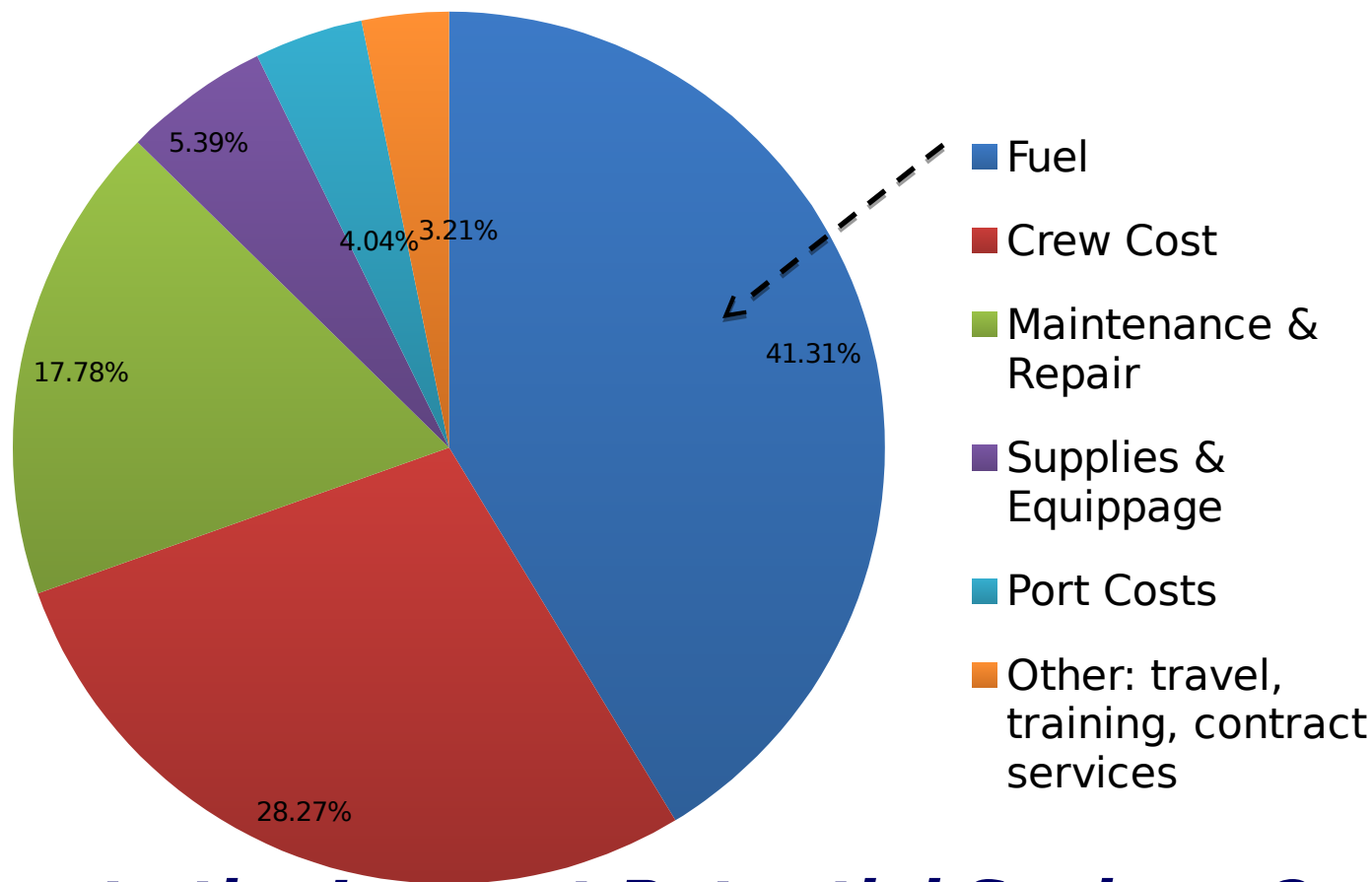
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# Annual MSC Ship Operating Cost

## T-AKE Annual Operating Costs (Per Ship)



**Fuel Represents the Largest Potential Savings Opportunity**

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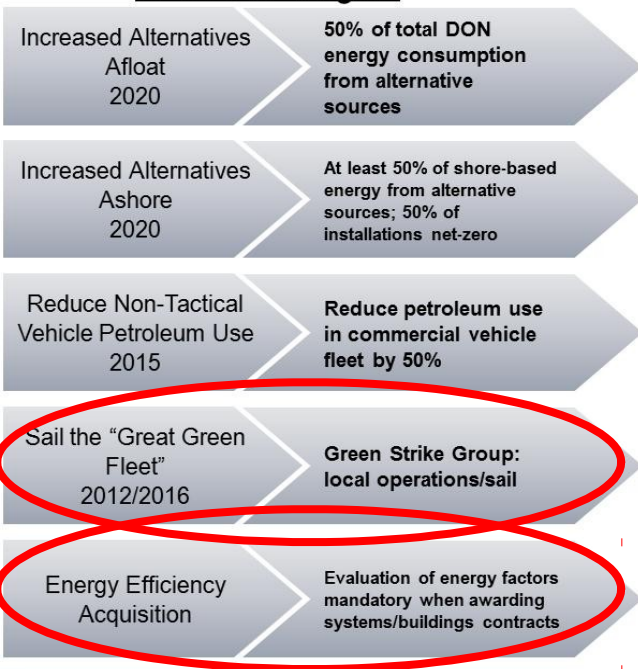
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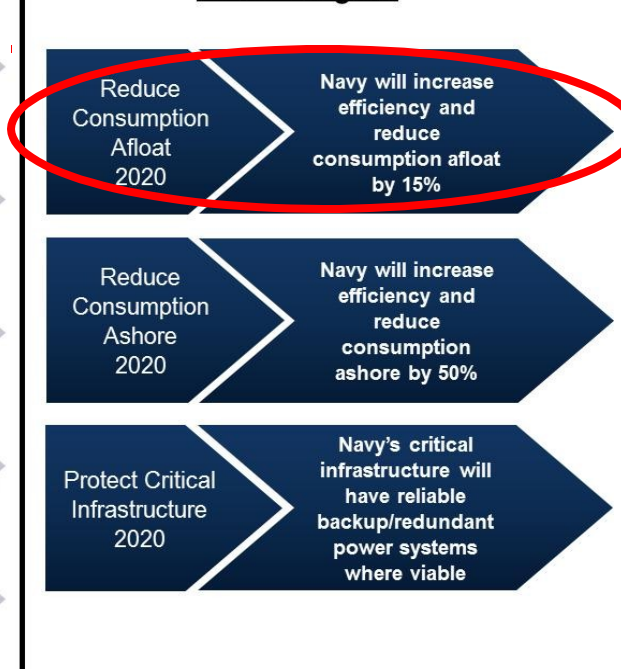
# US Navy Energy Goals & MSC ENCON Program



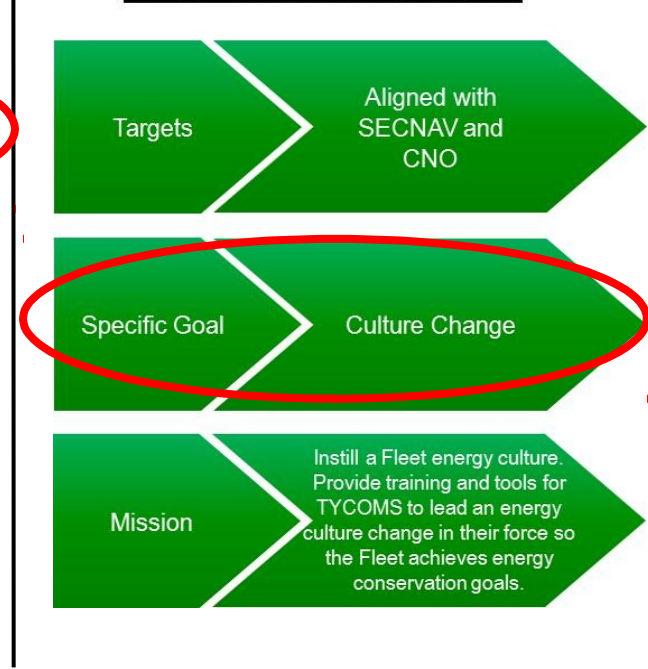
## SECNAV Targets



## CNO Targets



## USFF Command Goals



## MSC's Energy Conservation Program Initiatives Lining Up to

- 2016 Great Green Fleet WGs Member
- Collaboration with NAVSEA 05D4 and Member of T-AO(X) Energy Working Group

- ### Navy Energy Goals
- On target for meeting 15% reduction in fuel usage by 2020
  - Includes Technology/Hardware and Operational/Behavioral Initiatives
  - Part of Maritime Working Group in OPNAV N45 Task Force Energy

- Shipboard Energy Efficiency Management Plan (SEEMP)
- Energy Training module is part of the Civ Mar Engineering Officer's Training
- MSC Energy Awards and Recognition Program

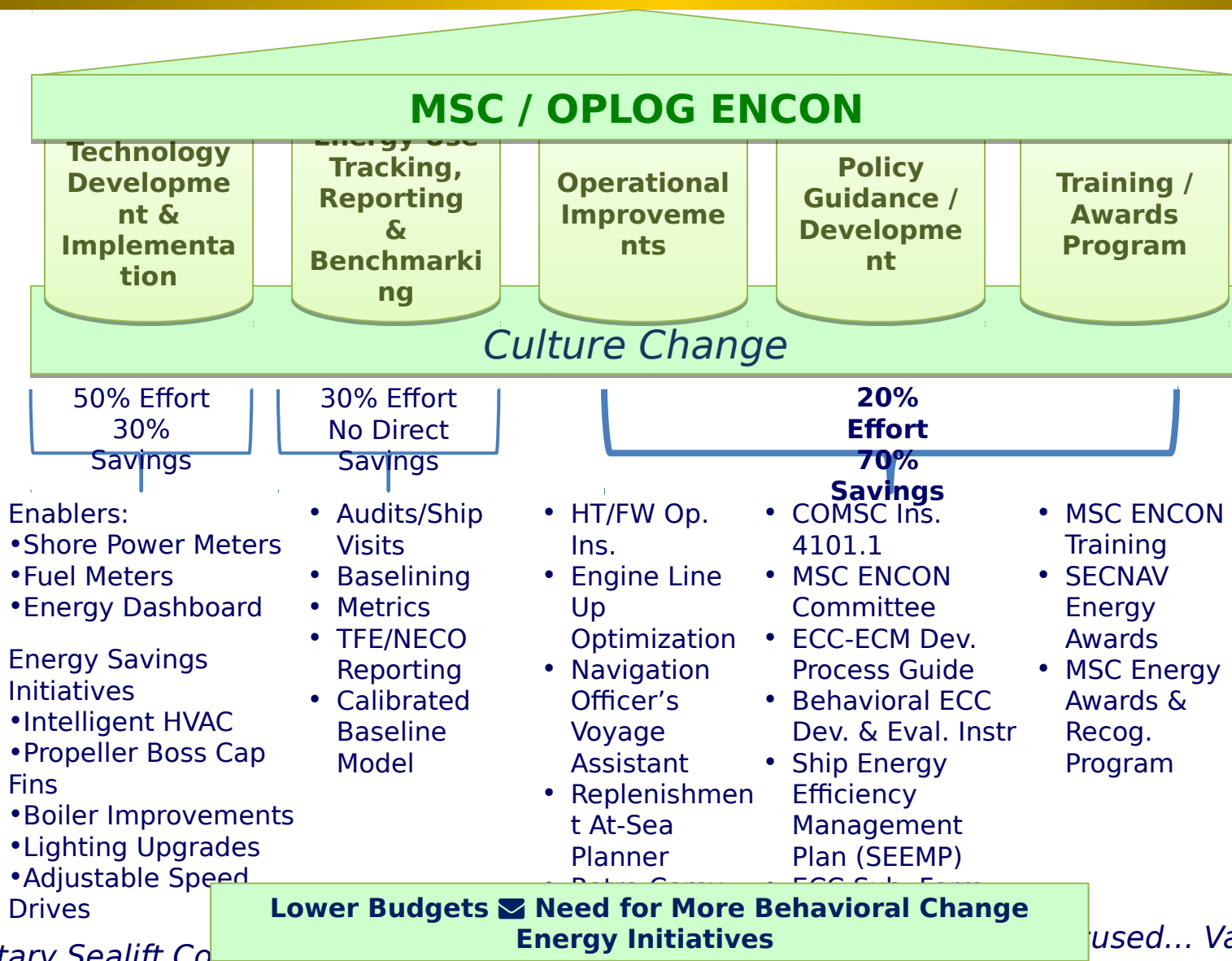
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# ENCON 5 Pillars



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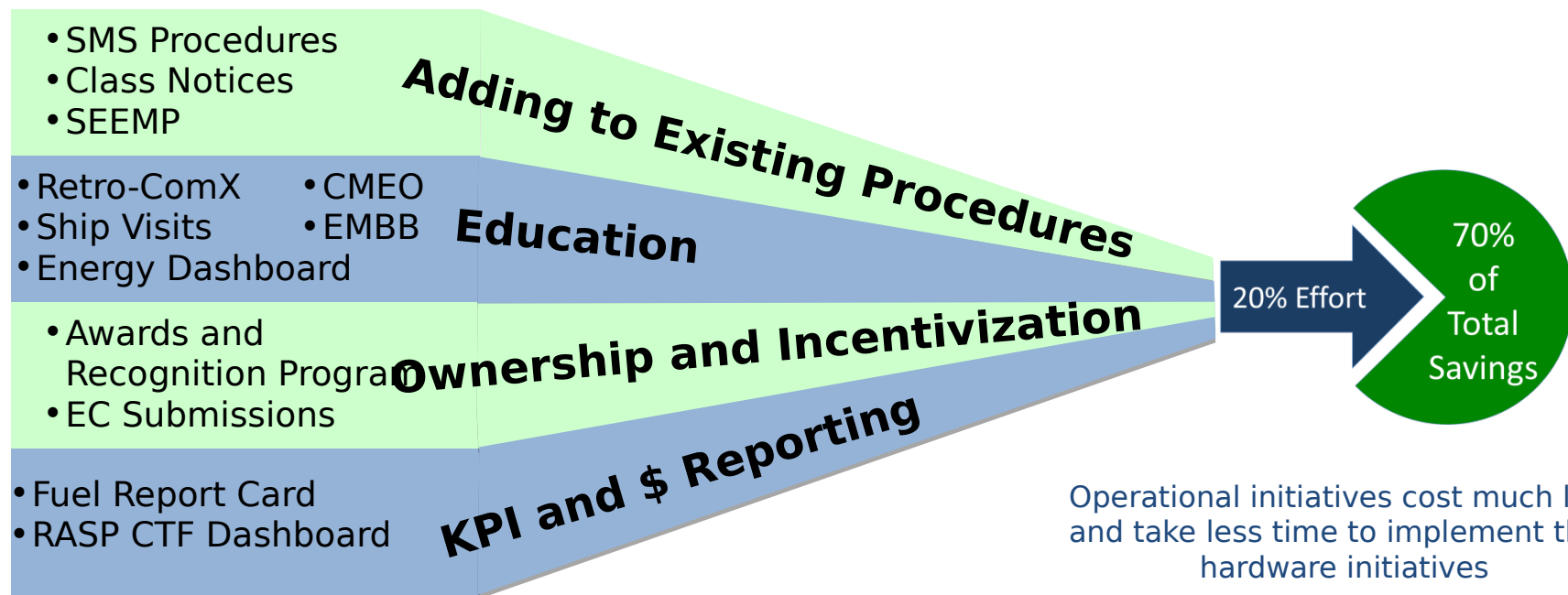
used... Value-

Speed

driven



# Influencing Energy Priority Behaviors



***In order to change behavior and long term culture, need to approach from all angles***

- ***Existing operating manuals and guidelines need to be revisited with an energy focus***
- ***Proven operational initiatives need to be required to realize actual savings***

***No more low hanging fruit? Will need to take on some risk for larger gains and will need the endorsement of top level management***





# Culture Change Enabler: RASP Dashboard



## Task Force Commander's Dashboard

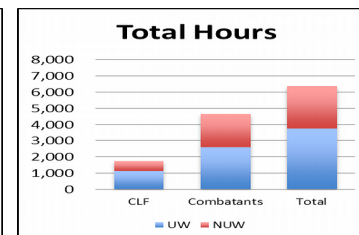
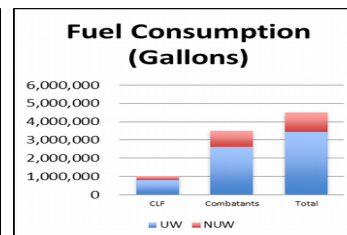
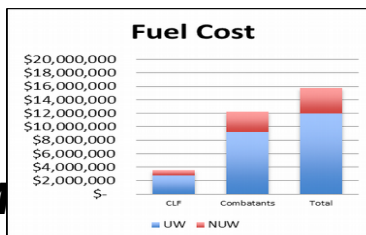
Report Start Date: 1 Jan 2014  
Report End Date: 31 Jan 2014

Ships Reported: 5  
Combatant Ships Reported: 19

### Baseline Schedule

Total RAS events: 14

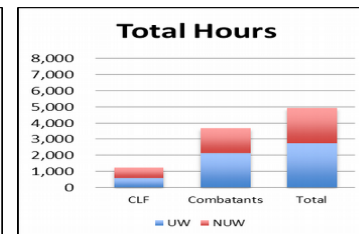
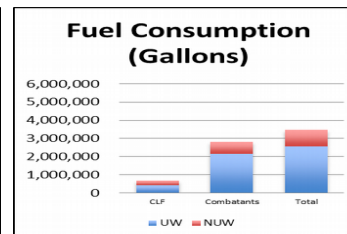
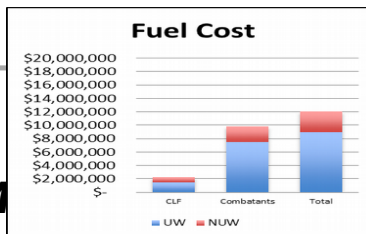
**Total Fuel Cost: \$15.8M**



### Course of Action 1

Total RAS events: 11

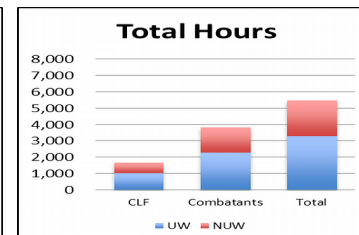
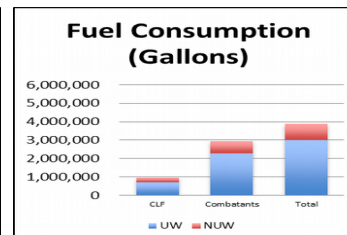
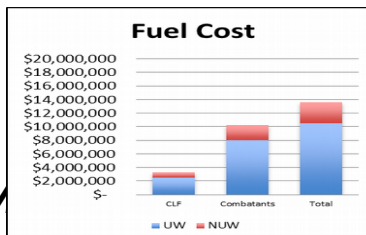
**Total Fuel Cost: \$12.1M**



### Course of Action 2

Total RAS events: 12

**Total Fuel Cost: \$13.6M**



- **Culture change needs to happen at all levels**
- **Include additional course of action options based on adjusted fuel trigger points**

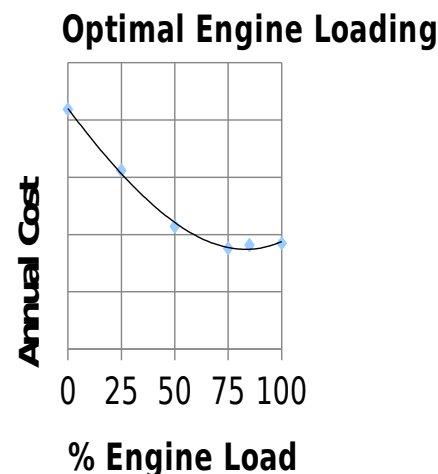




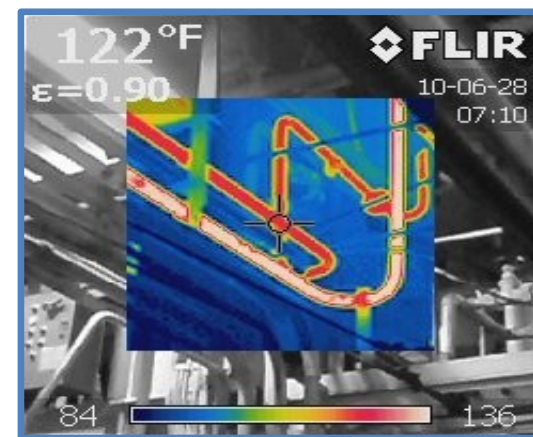
# MSC Energy Training



- **Three-hour intensive session focused on improving on-board operating practices for better efficiency; 4 completed classes since Feb 2014**
- **Direct, hands-on examples:**
  - **Engine Loading, HVAC, Air Compressors, Engine Cooling and Preheating, Lighting, Vessel Speed, Underwater Hull, Shore Power, and Securing Equipment**
- **Emphasis on both reduced consumption and reduced cost**
- **Four versions: Senior Engineers, Junior Engineers, Senior Deck Officers, and Port Engineers & Shoreside Support Staff**



## Jacket Water Preheating



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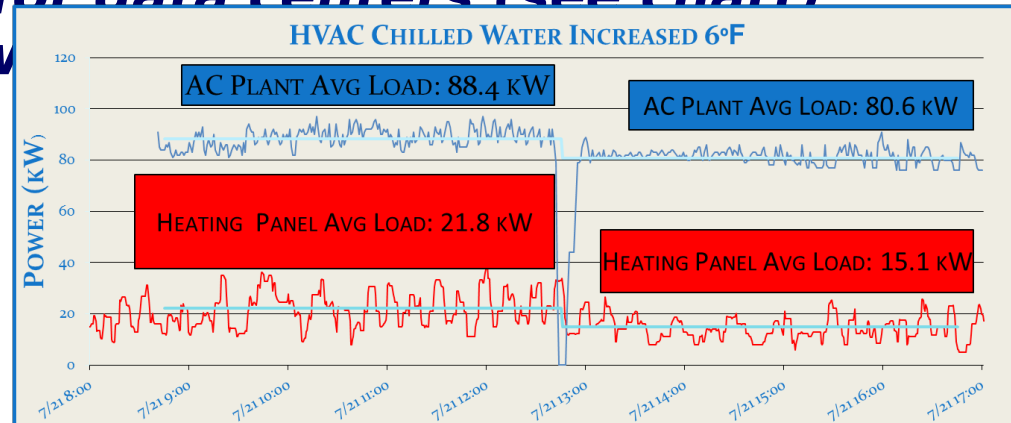
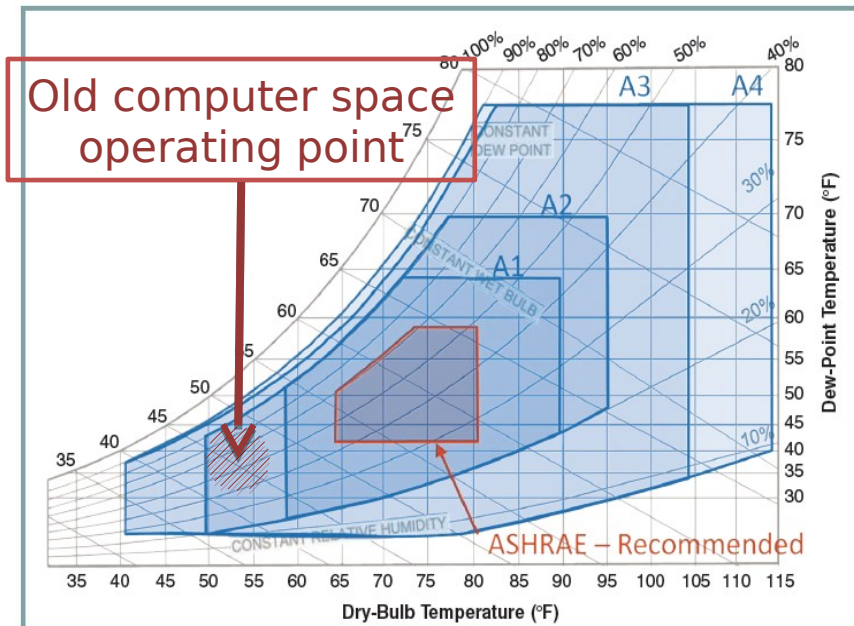
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Adding computer-based format and

# Training/Retro-Commissioning Example

## Chill Water System:

- **Centralized chill water system temperature was set low, between 36°F and 44°F, to enable keeping Radio Room and Cargo Control Room (computer spaces) cooled (observed down to 50°F)**
- **Other habitability spaces then reheated to desired temperature**
- **ASHRAE actually recommends a higher air temperature envelope for data centers (see chart)**



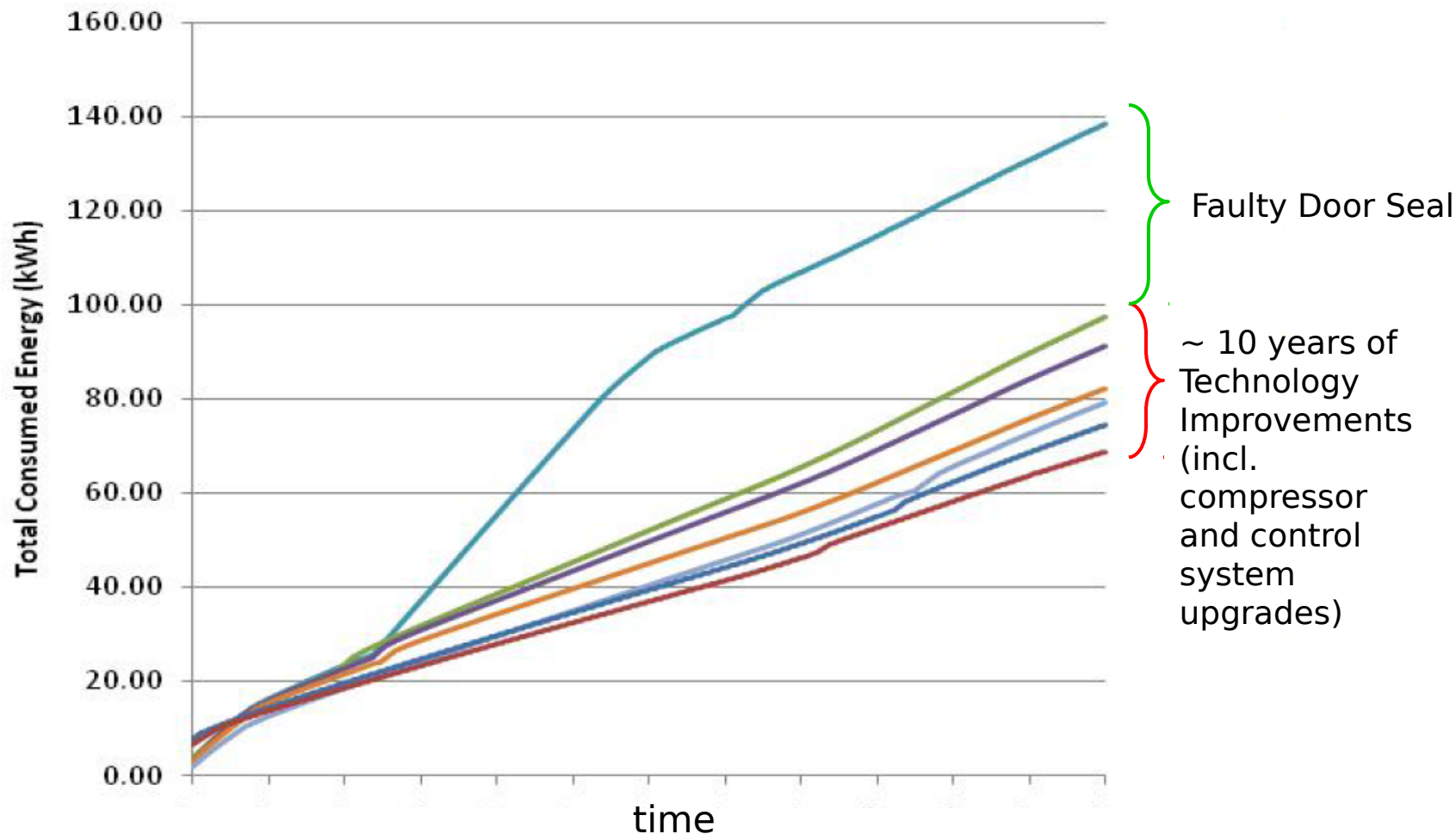
Total estimated energy savings from reduced load on chiller compressors and reduced reheating demand:  
**\$42,650 per ship, per year**



# Maintenance vs. Technology



## Refrigerated Containers Cumulative Energy - 24 Hours



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# MSC ENCON Summary



- **Behavior/Culture change is a major factor of the 5 pillar approach to MSC's Energy Conservation Program**
- **It is possible to reduce energy cost and improve operational capability**
  - Longer range, more days at sea, reduced maintenance, reduced fueling

## **You Make a Difference**

- **Support SECNAV, CNO, USFF and COMMSC Energy Goals**
- **Culture Change = minimal investment for maximum savings**
- **Get educated, provide input & challenge the status quo**



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